

entitled Errors (p. 781–932), which presents information available to the authors concerning errors in mathematical tables up to 1954, when this part of the *Index* was sent to press. The first source of this information was the relevant material amassed at the Scientific Computing Service under the direction of Dr. Comrie. Following his death in 1950, the remaining authors of this edition performed a further examination of tables for errors. The remaining main source was the notices of table errata appearing regularly in *Mathematical Tables and other Aids to Computation*. The authors considered this division of the book subsidiary to their main objective, which was to discover what tables of a given function exist. Incomplete as Part III must necessarily be, inasmuch as errors are continually being discovered in tables, nevertheless, this division of the book should prove extremely valuable to users of tables.

The elaborate Introduction (p. 1–18) is most informative, and should be read carefully by all users of this index. Included therein are introductory historical remarks, a large amount of bibliographic information, and a detailed description of the arrangement of the material in the *Index*. Reference is made to previous general indexes, such as those by Davis, Davis & Fisher, Schütte, Lebedev & Fedorova, and Buronova. Collections of mathematical formulas are cited; these include compilations by Láska, Adams & Hippisley, Silberstein, Kamke, Tölke, Magnus & Oberhettinger, Erdélyi, and Ryshik & Gradstein. This information is supplemented by enumerations of: handbooks for physicists and engineers; tables of integrals; lists of Fourier transforms, Laplace transforms, and Mellin transforms; textbooks and treatises on numerical methods and related theory; publications relating to the numerical solution of differential equations and of integral equations; manuals on calculating machines and instruments; books on nomography; astronomical tables; nautical tables; financial tables; statistical tables; and standard references on probability and statistics. Tables in the theory of numbers are not cited to any appreciable extent, for it was felt by the authors that adequate coverage has been provided by relevant indexes prepared by A. Cayley and D. H. Lehmer and by notes and papers appearing regularly in *MTAC* and *Math. Comp.*

The book closes with Part IV: Index to Introduction and Part I (p. 933–994). One reference omitted is that to transport integrals (subsection 22.65).

It is difficult in this limited space to convey an adequate idea of the wealth of information available in this edition. The new *Index* certainly is pre-eminent among the books of its kind, and is a worthy successor to the first edition, which was elaborately reviewed in this journal by the late R. C. Archibald (*MTAC*, v. 2, 1946, p. 13–18).

In a work of this size errors must almost inevitably appear; a number of these are listed in the appropriate section of this issue of *Math. Comp.* These are relatively inconsequential flaws, and this monumental work can be most highly recommended as an indispensable accession to the library of every computation laboratory, and should be readily available to teachers, students, and practitioners in the field of numerical mathematics.

J. W. W.

34[A–F, K–N, Q].—SAMUEL M. SELBY, ROBERT C. WEAST, ROBERT S. SHANKLAND, CHARLES D. HODGMAN, Editors, *Handbook of Mathematical Tables*, Chemical

Rubber Publishing Company, Cleveland, Ohio, 1962, x + 579 p., 23 cm. Price \$7.50.

The present volume is a further enlargement, reformatting, and repricing of the *CRC Standard Mathematical Tables* [1], which were themselves an outgrowth of the *Mathematical Tables from Handbook of Chemistry and Physics*.

The larger pages and type size in the new volume are a distinct improvement. The new tables (or sections) in the hundred or so extra pages include the following:

1. Six-place common logarithms (18 pages)
2. Table of Random Units (8 pages)
3. Legendre Function formulas (3 pages)
4. Surface Zonal Harmonics,  $P_n(x)$  (10 pages)
5. Definitions of Concepts in Set Theory, Groups, Fields, etc. (7 pages)
6. Planetary Elliptic Orbit Theory (9 pages)
7. Binomial and Poisson Distributions (16 pages)
8. Dictionary of Curves and Surfaces (8 pages).

There exists, as in the older editions [1], a certain amount of disorder in the sequencing of the tables. Although the table of Factors and Primes is no longer found between the Elliptic Integrals and the table of Indefinite Integrals, as it was in the 10th edition of the CRC, some new disorder has entered. Thus, tables of factorials occur on page 209 and much later on page 260, the degree-radian tables are not adjacent to the trigonometric, the algebraic formulas and the (often duplicating) "miscellaneous" algebraic formulas are separated by the Planetary Orbits, and the Probable Error and  $\chi^2$  tables are far removed from other statistical tables.

Although some of the tables, such as the 23-page table of  $\sin^2 \theta$ ,  $\cos^2 \theta$ , and  $\sin \theta \cos \theta$ , may strike certain readers as not being of urgent utility, the collection as a whole is certainly very useful.

D. S.

1. *CRC Standard Mathematical Tables*, Tenth & Eleventh Editions, RMT **61**, MTAC, v. 12, 1958, p. 146.

**35[D].**—HERBERT E. SALZER & NORMAN LEVINE, *Table of Sines and Cosines to Ten Decimal Places at Thousandths of a Degree*, Pergamon Press, New York, 1962, xiv + 900 p. (unnumbered), 22 cm. Price \$10.00.

This extensive table is a compilation of electronically computed 10D values of sines and cosines, without differences, arranged semiquadrantly in adjacent columns, at an increment of  $0.001^\circ$  in the argument. Each entry is printed *in extenso*, thereby obviating the necessity of searching generally elsewhere on the page for the leading three digits, as in other large tables of this kind.

In the introductory text Dr. Salzer shows in detail that linear interpolation in this table yields results correct to within a unit in the tenth decimal place. He cites the 15D table of sines and cosines published by the National Bureau of Standards [1], corresponding to an interval of  $0.01^\circ$ , which permits the attainment of only 8D accuracy when linear interpolation is used. Reference is also made to a table of Peters [2], which includes also the tangent and cotangent; it is arranged according to the subdivision  $0.001^\circ$ , but is limited to seven decimal places.

These limitations in earlier tables constitute the stated justification for the prepa-